

Claims

[1] A reciprocating compressor comprising:
a casing including a suction pipe through which a fluid is introduced from the outside and a discharge pipe through which the fluid is discharged outside and forming a predetermined internal space;
a compressor main body positioned in the casing, compressing the fluid introduced through the suction pipe with a linear reciprocating motion of a piston and discharging the compressed fluid through the discharge pipe; and
a supporting unit including a plurality of coil springs connecting the compressor main body to the casing,
wherein the plurality of coil springs includes, respectively, end coils tightly wound so as to be fixed to one surface of the compressor main body and to one surface of the casing, respectively; and an inner coil having at least one part which is tightly wound and positioned between the end coils.

[2] The compressor of claim 1, wherein the inner coil comprises:
a pair of elastic parts respectively wound from the end coils at predetermined pitches; and
a mass part tightly wound between the pair of elastic parts.

[3] The compressor of claim 2, wherein each of the elastic parts is wound at regular pitches.

[4] The compressor of claim 2, wherein each of the elastic parts is wound at pitches increased as it goes from the end coil toward the mass part.

[5] The compressor of claim 2, wherein each of the elastic parts is wound at pitches decreased as it goes from the end coil toward the mass part.

[6] The compressor of claim 2, wherein each of the elastic parts is wound at pitches increased and decreased alternately between the end coil and the mass part.

[7] The compressor of claim 2, wherein the winding number of the mass part is two ~ four times as many as that of the end coil.

[8] The compressor of claim 1, wherein the inner coil comprises:
a pair of mass parts tightly wound right next to the end coils; and
an elastic part positioned between the pair of mass parts and wound at pre-determined pitches.

[9] The compressor of claim 8, wherein the winding number of the mass part is two ~ four times as many as that of the end coil.

- [10] The compressor of claim 9, wherein the elastic part is wound at regular pitches.
- [11] The compressor of claim 9, wherein the elastic part is wound at pitches decreased as it goes toward a central portion of the coil spring.
- [12] The compressor of claim 9, wherein the elastic part is wound at pitches increased as it goes to the central portion of the coil spring.
- [13] The compressor of claim 9, wherein the elastic part is wound at pitches increased and decreased alternately.
- [14] The compressor of claim 1, wherein the inner coil comprises:
 - a first elastic part wound from the end coil fixed to one surface of the compressor main body at predetermined pitches;
 - a second elastic part wound from the end coil fixed to one surface of the casing at predetermined pitches that are different from those of the first elastic part; and
 - a mass part tightly wound between the first and second elastic parts.
- [15] The compressor of claim 14, wherein the first and second elastic parts respectively have regular pitches, and the two pitches are different from each other.
- [16] The compressor of claim 14, wherein the first and second elastic parts are wound at pitches increased as it goes toward the mass part, and the increasing ratios of the pitches of the first elastic part and the pitches of the second elastic part are different from each other.
- [17] The compressor of claim 14, wherein the first and second elastic parts are wound at pitches decreased as it goes toward the mass part, and the decreasing ratios of the pitches of the first elastic part and the pitches of the second elastic part are different from each other.
- [18] The compressor of claim 14, wherein the first and second elastic parts are wound at pitches increased and decreased alternately as it goes toward the mass part, and the increasing and decreasing ratios of the pitches of the first elastic part and the pitches of the second elastic part are different from each other.
- [19] The compressor of claim 14, wherein one of the first and second elastic parts is wound at regular pitches, but the other elastic part is wound at pitches increased as it goes toward the mass part.
- [20] The compressor of claim 14, wherein one of the first and second elastic parts is wound at regular pitches, but the other elastic part is wound at pitches decreased as it goes toward the mass part.
- [21] The compressor of claim 14, wherein one of the first and second elastic parts is

wound at regular pitches, but the other elastic part is wound at pitches increased and decreased alternately as it goes toward the mass part.